

WHAT IS CLAIMED IS:

1. An apparatus for mixing by agitation comprising:
a casing having a flow channel though which may pass a
5 fluid;
an agitation body consisting of a shaft installed in said
casing and connected to a vibration source, and one or more
agitation blades attached to the perimeter of the shaft;
two or more inlets for feeding a liquid or a powder into
10 said casing, and
one or more agitating chambers separated from other
regions in said casing by a divider plate in a state capable
of communicating with the other regions, wherein
at least one of the agitating chambers is a pre-agitation
15 mixing chamber to which the inlets are attached, and
a portion of the agitation blades to be positioned in the
pre-agitation mixing chamber on the agitation body is provided
in such a manner that the shape of the agitation blades and/or
the agitation area of the agitation blades can be changed
20 according to the degree of agitation.
2. An apparatus for mixing by agitation according to claim 1,
wherein one or more agitation blades of at least one type,
selected from a plurality of types of agitation blades each
25 having a unique shape, are mounted on the perimeter of the
shaft of the agitation body.
3. An apparatus for mixing by agitation according to claim 1,
wherein said divider plate is perforated with one or more

holes and one or both of the number or the size of the holes is set so as to vary the degree of agitation within the casing.

4. An apparatus for mixing by agitation according to claim 1,
5 wherein said agitation blade is perforated with one or more holes according to the agitation area and one or both of the number or the size of the holes is set so as to vary the degree of agitation within the casing.

10 5. An apparatus for mixing by agitation according to claim 1, wherein a filter is installed in said casing so as to enclose said agitation body.

6. An apparatus for mixing by agitation according to claim 5,
15 further comprising:

a filtered drain port from which a mixture filtered by said filter is drained, and

an unfiltered drain port from which a mixture incapable of being filtered by said filter is drained, wherein

20 the unfiltered drain port is connected to an open/close valve which opens when an internal pressure at the unfiltered drain port reaches to or goes beyond a predetermined value, or an open/close valve which opens at regular time interval.

25 7. An apparatus for mixing by agitation according to claim 6, further comprising a coupling duct which connects said filtered drain port or unfiltered drain port to said inlet duct.

8. An apparatus for mixing powder and liquid by agitation comprising:

a casing having a flow channel through which a fluid may pass;

5 an agitation body consisting of a shaft installed in said casing and connected to a vibration source, and an agitation blade attached to the perimeter of the shaft;

a powder inlet mounted on said casing to feed a powder into the casing;

10 a liquid inlet mounted on the casing in the vicinity of said powder inlet to feed a liquid into the casing, and a powder inlet duct connected to said powder inlet.

9. An apparatus for mixing powder and liquid by agitation according to claim 8, wherein said powder inlet and said liquid inlet are both placed at either the upper part of said casing or the lower part of said casing.

10. An apparatus for mixing powder and liquid by agitation according to claim 8, wherein

a pre-agitation mixing chamber capable of communicating with other regions in the casing is further mounted on either the upper part of the casing or the lower part of the casing, and

25 said powder inlet and said liquid inlet are both attached to the pre-agitation mixing chamber placed at either the upper part of the casing or the lower part of the casing.

11. An apparatus for mixing powder and liquid by agitation

according to claim 8, wherein one or more agitation blades of at least one type, selected from a plurality of types of agitation blades each having a unique shape, are mounted on the perimeter of the shaft of the agitation body.

5

12. An apparatus for mixing powder and liquid by agitation according to claim 8,

further comprising at least two packings which allow outflows of the liquid from a vibration source side while
10 protecting the vibration source from inflows of fluid,

wherein said liquid inlet, situated at a position above or below the powder inlet, is capable of feeding the liquid into a space formed between the two packings.

15 13. An apparatus for mixing powder and liquid by agitation according to claim 8, wherein said agitation blade is perforated with one or more holes and one or both of the number or size of the holes is set so as to vary the degree of agitation within the casing.

20

14. An apparatus for mixing powder and liquid by agitation according to claim 8, wherein a filter is installed in said casing so as to enclose said agitation body.

25 15. An apparatus for mixing powder and liquid by agitation according to claim 14, further comprising:

a filtered drain port from which a mixture filtered by said filter is drained, and

an unfiltered drain port from which a mixture incapable

of being filtered by said filter is drained, wherein

the unfiltered drain port is connected to an open/close valve which opens when an internal pressure at the unfiltered drain port reaches to or goes beyond a predetermined value, or
5 an open/close valve which opens at regular time interval.

16. An apparatus for mixing by agitation according to claim 15, further comprising a coupling ducts which connects the filtered drain port or the unfiltered drain port to said inlet
10 duct.

17. A method for mixing powder and liquid by agitation comprising:

feeding a powder and a liquid simultaneously or
15 intermittently into a casing having a vibratory agitation blade and then agitating by vibration.

18. A method for mixing powder and liquid by agitation comprising the steps of:

20 a mixed powder formation step in which a mixed powder is prepared by blending at least two kinds of powders, and

a vibratory agitation step in which the mixed powder and a liquid are fed into the casing simultaneously or intermittently and then agitated by vibration.

25 19. A method for mixing by agitation comprising:

changing the degree of agitation as the occasion demands in the same flow channel in which fluid passes through.